Listing of Claims

1-21. (cancelled)

22. (currently amended) A pedestal for supporting a substrate during plasma processing, said pedestal comprising:

an electrode configured for generating an electric field;

a chuck disposed above said electrode, said chuck being configured for holding said substrate;

[[an]] a generally planar edge ring disposed above said electrode **and extending underneath a substrate when positioned on said chuck**, said edge ring being formed from a dielectric material and configured for shielding said electrode and said chuck **with inner edge portions proximate an edge of said substrate and an edge of said chuck and an outer edge portion extending to one edge of said electrode**; and

an impedance matching layer disposed **and confined** between said electrode and said edge ring and underneath said substrate when said substrate is resting on said pedestal, said impedance matching layer being entirely planar and parallel with a top surface of the electrode and a bottom surface of the edge ring, said impedance matching layer being bonded to said electrode or said edge ring, said impedance matching layer having characteristics or features configured for controlling an impedance between said electrode and a plasma, said impedance being arranged to affect said electric field, wherein a first impedance produced through said chuck is different than a second impedance produced through said edge ring, and wherein said impedance matching layer is configured to alter said second impedance produced through said edge ring so that said second impedance is substantially equal to said first impedance produced through said chuck, the equalization of said impedances improving processing uniformity across the surface of said substrate by coupling energy more uniformly across the surface of the substrate.

23. (previously presented) The pedestal as recited in claim 22 wherein said impedance is configured to reduce variations in said electric field.

24. (cancelled)

25. (previously presented) The pedestal as recited in claim 22 wherein said impedance matching layer is arranged to control said impedance between said electrode and said plasma at the edge of said substrate.

26. (cancelled)

27. (previously presented) The pedestal as recited in claim 22 wherein said impedance matching layer is configured to be disposed between said electrode and said substrate when said substrate is held by said chuck.

28. (previously presented) The pedestal as recited in claim 22 wherein said first portion cooperates with said chuck to define an area for receiving a bottom surface of said substrate.

29. (previously presented) The pedestal as recited in claim 22 wherein said edge ring has a second portion extending above said first portion, said first portion being configured to surround an outer edge of said chuck, said second portion being configured to surround an outer edge of said substrate when said substrate is held by said chuck for processing whereby said edge ring cooperates with said chuck to form a recessed portion for accepting said substrate for processing.

30. (previously presented) The pedestal as recited in claim 22 wherein said chuck has an outer periphery that is smaller than an outer periphery of said substrate.

31. (previously presented) The pedestal as recited in claim 22 wherein said impedance matching layer is formed from a dielectric material.

32. (previously presented) The pedestal as recited in claim 22 wherein said chuck, edge ring and impedance matching layer are formed from a dielectric material, wherein the dielectric constant of said edge ring is equal to the dielectric constant of said chuck, and wherein the dielectric constant of said impedance matching layer is different than the dielectric constant of said edge ring and said chuck.

33. (cancelled)

34. (currently amended) A pedestal for supporting a substrate during plasma processing, said pedestal comprising:

an electrode for generating an electric field between a plasma and said electrode, said electrode having an inner region and an outer region;

a chuck disposed above said inner region of said electrode, said chuck being configured for holding said substrate during processing, said chuck affecting a first impedance between said electrode and said plasma in an area above said inner region of said electrode;

an edge ring disposed above said outer region of said electrode and positioned next to a side of said chuck, said edge ring being configured for shielding at least said electrode from said plasma **with inner edge portions proximate an edge of said substrate and an edge of said chuck and an outer edge portion extending to one edge of said electrode**, said edge ring affecting a second impedance between said electrode and said plasma in an area above said outer region of said electrode;

an impedance matching layer disposed **and confined** between said edge ring and said electrode and above said outer region of said electrode, said impedance matching layer having characteristics configured to adjust said second impedance so as to improve processing uniformity across the surface of said substrate, said impedance matching layer being configured to match the impedance between said electrode and said plasma at the edge of said substrate with the impedance between said electrode and said plasma at the center of said substrate.

35. (previously presented) The pedestal as recited in claim 34 wherein said chuck is an electrostatic chuck.

36. (previously presented) The pedestal as recited in claim 34 wherein said impedance matching layer is bonded to said edge ring.

37. (previously presented) The pedestal as recited in claim 34 wherein said impedance matching layer is bonded to said electrode.

38. (withdrawn) The pedestal as recited in claim 34 wherein the length and position of said impedance matching layer with respect to said edge ring is adjusted to control said second impedance.

39. (previously presented) The pedestal as recited in claim 34 wherein the impedance matching layer is formed from a material with a dielectric constant, wherein said dielectric constant is adjusted to control said second impedance.

40. (withdrawn) The pedestal as recited in claim 34 wherein the thickness of said impedance matching layer is adjusted to control said second impedance.

41. (previously presented) The pedestal as recited in claim 34 wherein said electrode has an outer periphery that is greater than or equal to the outer periphery of said substrate when said substrate is disposed on said chuck for processing.

42. (previously presented) The pedestal as recited in claim 34 wherein said electric field produces a uniform sheath voltage at the surface of said substrate when said substrate is disposed on said chuck for processing.

43. (previously presented) The pedestal as recited in claim 34 wherein said electrode is coupled to an RF power source configured to supply RF energy to said electrode.

44. (previously presented) The pedestal as recited in claim 34 further comprising a heat transfer system for controlling the temperature of said substrate and said edge ring during processing, said heat transfer system including a first channel extending through said electrode to the interface between said chuck and said substrate, and a second channel extending through said electrode to the interface between said electrode and said edge ring, said heat transfer system being configured to provide a heat transfer medium through said channels.

45. (previously presented) The pedestal as recited in claim 44 wherein said heat transfer medium is a helium gas.

46. (cancelled)

47. (previously presented) The pedestal as recited in claim 34 wherein said inner region of said electrode corresponds to an inner portion of said substrate when said substrate is disposed over said chuck for processing, and wherein said outer region of said electrode corresponds to an outer portion of said substrate when said substrate is disposed over said chuck for processing.

48. (cancelled)

49. (currently amended) A uniformity mechanism suitable for use in a process chamber within which a plasma is ignited and sustained for processing a substrate, the uniformity mechanism comprising:

a first component **including a chuck** disposed underneath an inner region of the substrate when the substrate is positioned inside the process chamber for processing, the first component producing a first impedance when energy is coupled therethrough;

a second component **including a planar edge ring** disposed underneath an outer region of the substrate when the substrate is positioned inside the process chamber for processing, **and extending underneath a substrate when positioned on said chuck** the second component producing a second impedance when energy is coupled therethrough, the first impedance being different than the second impedance; and

an impedance matching layer **disposed and confined under said edge ring and** having characteristics configured to adjust the second impedance such that the second impedance is substantially equal to the first impedance, said characteristics including at least one of a thickness, a length, a position, or a material property, at least a portion of the impedance matching layer being disposed underneath the substrate when the substrate is positioned inside the process chamber for processing.

50. (cancelled)

51. (previously presented) The uniformity mechanism as recited in claim 49 wherein the impedance matching layer is disposed below said second component.

52. (previously presented) The uniformity mechanism as recited in claim 49 wherein the uniformity mechanism is configured for supporting the substrate during processing.

53. (cancelled)

54. (previously presented) The uniformity mechanism as recited in claim 49 further including a third component for generating an electric field.

55. (previously presented) The uniformity mechanism as recited in claim 49 wherein the first and second components are disposed above an electrode.

56. - 59. (cancelled)

60. (previously presented) The pedestal as recited in claim 22 wherein the electrode is formed from a conductive material, and wherein the chuck, the edge ring and the impedance matching layer are formed from a dielectric material.

61. (previously presented) The pedestal as recited in claim 60 wherein the dielectric constant of said edge ring is equal to the dielectric constant of said chuck, and wherein the dielectric constant of said impedance matching layer is larger than the dielectric constant of said edge ring and said chuck in order to compensate for increased impedance that exists at the edge of the chuck.

62. (withdrawn) The pedestal as recited in claim 22 wherein the electrode is formed from a conductive material, the chuck and the edge ring are formed from a dielectric material, and the impedance matching layer is formed from a semi-conductive or conductive material.

63. (previously presented) The pedestal as recited in claim 22 wherein the impedance matching layer is formed from silicon, silicon oxide, silicon nitride, silicon carbide, quartz, aluminum, anodized aluminum or aluminum oxide.

64. (cancelled)

65. (previously presented) The pedestal as recited in claim 22 wherein the impedance matching layer is disposed between the edge ring and the electrode only in the region of the substrate.

66. (previously presented) The pedestal as recited in claim 22 wherein the top surface of the electrode is configured to be substantially uniform and substantially parallel to the substrate so as to provide an even distribution of energy.

67. (previously presented) The pedestal as recited in claim 34 wherein the impedance matching layer is bonded to the edge ring or the electrode via a silicon elastomer and wherein the edge ring is formed from a dielectric material and is electrically floating or electrically coupled to a DC ground.

68. (previously presented) The pedestal as recited in claim 44 wherein the impedance matching layer is bonded to a backside of the edge ring, and wherein the first channel is configured to distribute the heat transfer medium to a first gap located between the chuck and the backside of the substrate, and wherein the second channel is configured to distribute the heat transfer medium to a second gap located between the electrode and the backside of the edge ring that includes the impedance matching layer.

69. (cancelled)